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ABSTRACT

To aid in the search for exemplary environmental education programs, the National Science Teachers Association has developed this inventory of science programs related to the environment. Only those programs which have materials available to other school systems or individuals and who can handle inquiries are included. Sixty programs are listed in 28 states and two foreign countries - Canada and the Philippines. Each entry provides program name and address, program director and address, a brief description of the program, and materials available. The appendix contains sample materials of: a lesson plan for Grade One involving a trip to an outdoor laboratory; a state resolution for environmental education; a schedule for a one-week curriculum at an outdoor school; subject matter areas for a sixth grade resident environmental education program; curriculum activities for a half-day visit to an arboretum by Grades K-6; and environmental curriculum themes for Grades 1-12. A related document is SE 012 628. (BL)

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PROGRAMS IN ENVIRONMENTAL EDUCATION

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Compiled by
The National Science Teachers Association

1970

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PROGRAMS IN ENVIRONMENTAL EDUCATION

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FOREWORD

An eagerness to develop programs of environmental education and to profit from the experiences of others leads many science teachers and curriculum planners to search for examples of such programs. This publication is an effort by the National Science Teachers Association to aid in this search and to serve as a clearinghouse for exchange of information about science programs related to the environment. NSTA sought information about these programs as part of a survey to update the NSTA bibliographies on Curriculum Materials and Courses of Study in Science. The inquiry form was sent to all state supervisors of science, all members of the National Science Supervisors Association, and school systems represented in the NSTA curriculum bibliographies. As with the bibliographies, the primary purpose was to locate materials that are available to other school systems or individuals. A second request to the schools having environmental programs was to report only those that could handle inquiries, either by mail or in person. Because of these stipulations relating to materials and service, many programs and probably excellent ones are not described here. This listing, therefore, makes no claim to being a directory or even a compilation of all efforts underway. Nevertheless, the Association believes that as a first attempt in this emerging field, this publication will serve a useful purpose and may point the way for future efforts by the Association. Reactions and suggestions will be welcomed at any time.

In addition to the programs reported by school systems, many programs are underway as projects funded by Title III of the Elementary and Secondary Education Act or other government grants. Sources of descriptions of these programs are also included in this publication, since the catalogs of these programs are readily available.

Second printing November 1970, with Addenda on pages 52 and 53.

Mary E. Hawkins
Associate Executive Secretary, NSTA

PROGRAMS IN ENVIRONMENTAL EDUCATION

ALASKA

Environmental Studies Program
Kenai Peninsula Borough School District
Kenai, Alaska

Mr. John Jones
Director, Environmental Studies Program
Kenai Peninsula Borough School District
Box 539 Kenai, Alaska 99511

Description: This is a Title III (of Public Law 89-10) program for training teachers throughout Alaska in teaching techniques of environmental education in a five-day workshop in the summers of 1970, 1971, and 1972, with 6 hours of credit from the University of Alaska.

The 1970 workshop includes 40 participants working to incorporate environmental studies into language arts, fine arts, social studies, math and science for grades K-12. Activities include technique training, leadership training, inventory of local school environments, field training in alpine, meadow, bog, and marine environments. It will culminate in writing these studies into the present subject area curricula.

The school district is establishing a demonstration unit to serve as a guide for other districts in the state. A full-time director and instructor have been employed to assist in carrying out the year-round program, establish camps, and provide assistance in field experiences. Inservice workshops will be carried out during the year.

ARIZONA

Project Outreach
Phoenix Union High School System
Phoenix, Arizona

Mr. Robert R. Stonoff
Project Coordinator
Project Outreach
515 North 48th Street
Phoenix, Arizona 85008

Description: Outreach is the Outdoor Unified Training for Recreation, Education, Appreciation, Conservation, and Health, a project funded through Title III of Public Law 89-10. The activity-oriented project is designed to stimulate and bring about an active participation of the community in conservation and outdoor learning experiences and to encourage individuals to pursue hobbies and careers in scientific and outdoor-oriented areas.

In addition to overnight and multiday camp experiences, the Outreach staff and personnel from cooperating agencies will provide field activity programs at various county and city parks. Public and private school teachers will be invited to bring their students to the field program and participate in the activities.

ARIZONA (Continued)

A teacher-training program includes extension classes during the school year and summer workshops where teachers are provided opportunities to study in the outdoors and where they may acquire resource materials for class use as well as learn techniques for outdoor instruction.

CALIFORNIA

Environmental Science
Pasadena, California

Mr. Lee F. Browne
Teacher-Specialist-Science
351 South Hudson St.
Pasadena, California 91106

Description: This is a new course to be initiated in September 1970. It will include outdoor education, conservation, pollution, environmental systems, and sanitation.

Teachers will receive inservice training and workshop experiences and students will have preparatory and follow-up activities.

Materials: Curriculum guides.

Youth Science Institute
16260 Alum Rock Ave.,
San Jose, California

Mr. Clark Champion
Youth Science Institute
16260 Alum Rock Avenue
San Jose, California 95127

Description: The Institute is a non-profit organization that provides scientifically oriented experiences for children. It currently offers several different programs as follows:

Schamp (School-camp). Twelve Schamp trips are offered during the summer. Each is a nine-day back-packing experience in the High Sierra, which is preceded by three days of day-camp school in Alum Rock Park where the Institute operates a Children's Natural History Museum. Camp skills, alpine ecology, and personal involvement are emphasized.

Saturday Big Trips. A miniature version of Schamp with week-end trips during the school year to locations of natural beauty and interest in California.

School Program. The Institute offers school program (based on 10¢/ADA/year) to supplement the public school science curriculum. This includes live animal loans to teachers, inanimate material loans, guided tours of the Museum, guided nature walks in the Park, and special science lessons.

CALIFORNIA (Continued)

Outdoor Education School
Stockton Unified School District

Mr. Edwin Wager
Stockton Unified School District
701 N. Madison
Stockton, California 95202

Description: A one-week, residential program started last year as a part of the San Joaquin County Outdoor Education School Program.

Sixth-grade pupils and teachers participate on a voluntary basis for one week. Class groups accompanied by their teachers attend and participate in a week-long educational program at the Outdoor School. Specific activities include conservation education, ecology, marine tide-pool studies, earth science, safety, and survival studies.

The main objective is to involve pupils in firsthand experiences with environmental studies and problems. Our aim is to develop understanding and appreciation for the interrelationships of man and the natural environment.

Inservice training and teacher workshops are a part of the program, as are student preparation and follow-up.

Materials: San Joaquin County has developed curriculum guides.

CANADA

Bolton Outdoor Education Center
Bolton, Ontario, Canada

Principal
Bolton Outdoor Education Centre
Box 216
Bolton, Ontario, Canada

Description: The Centre, which is run cooperatively by three boards of education, has been in operation for one year. The building, on a 200-acre tract just north of Toronto, is leased from the Family Services Association, a United Appeal Agency. The school boards use the Centre from September to June, and the Family Services uses it during July and August. One of the school boards is nominally responsible for the program, and it supplies the principal and secretary-matron. Each of the three boards supplies two full-time staff members. The local teachers colleges provide six student teachers who live in residence and help with the program. The local community colleges are also providing students in their recreation courses to assist with the program.

The Centre operates a program for 72 pupils, from grades 6 to 13. They come for a school week. Specific program activities include wildlife studies, pioneer crafts, conservation, pollution, archeology, geology, survival, plant studies, recreation outdoors, etc.

CANADA (Continued)

Preplanning is done by the principal, and follow-up is left to the participating teachers. Some teachers have a one-day preplanning session at the Centre before arriving with their classes.

COLORADO

Jefferson County Outdoor Education Program
Jefferson County Public Schools
Lakewood, Colorado

Mrs. Sondra Jackson
Elementary Science Specialist
Jefferson County Public Schools R-1
809 Quail Street
Lakewood, Colorado 80215

Description: The aims of the Outdoor Education Program are to create appreciation of nature and respect for one's environment. The Jefferson County Outdoor Education School is in operation all but three weeks out of the school year. The program is offered to all 6th-grade youngsters in the school district for one entire week. The students sleep in dormitories and eat in a cafeteria operated at the school site. A fee of $20 covers all expenses. While at the Outdoor Educational School, the students pursue many avenues, with the main emphasis on ecological relationships. In addition, they also are involved in such things as a geology trail, botany, aquatic biology, animal tracks, crafts, singing, square dancing and obstacle course.

The Jefferson County Outdoor Education School is located nine miles west of Evergreen, Colorado - approximately a 45-minute drive from most schools in the district. Jefferson County owns 550 acres at this location, bordered by the Denver Mountain Parks and State Game, Fish and Parks, the Elk Management Preserve.

In addition to the week spent at the Outdoor School, 6th-grade students are involved in preparation and follow-up activities in the regular classroom. This program is an integral part of the curriculum and a highlight of 6th-grade.

Most 6th-grade classes also take several field trips before or after the week spent in the out-of-door that correlate and reinforce the outdoor program. For example, most 6th-grades take a geology field trip to Red Rocks Park. In this area, the geological formations are compared with those found at the Outdoor School. Some classes take a field trip to Squaw Mountain Fire Lookout in order to study the subalpine or alpine tundra as compared to the montane life zone in which the Outdoor School is located. Some classes take a field trip to the Plains Conservation Center in order to compare plains ecology with the other areas studied.

Inservice is offered for new 6th-grade teachers. The school district releases the new teachers for one half-day on a Friday afternoon the semester they are going to take their students to the Outdoor School. The workshop comprises a Friday afternoon, evening, and a half-day on Saturday. During

this time, the teachers become acquainted with a few of the trails, the facilities available, and a general introduction to the philosophy and teaching method used in the program. An attempt is made to utilize an inductive teaching approach in nature, as well as in the regular classroom. Students are involved as much as possible in the learning situation.

In addition to the district inservice, several college courses are offered at night and in the summer in which a teacher can receive additional preparation in a specific subject area, such as aquatic biology, ecology, or geology. In the summer, a two-week workshop is offered for graduate credit from a local college on outdoor education and on montane ecology. Inquiries regarding these courses should also be addressed to the above person.

Materials: The Jefferson County Outdoor Education Guide. This guide was ranked as second in the nation in a recent contest involving all guides of this nature. It sells for $5 and can be acquired from: Jefferson County Public Schools, 809 Quail Street, Lakewood, Colorado 80215, Attn: Dr. James Mortensen, Director of Curriculum.
See also Appendix p. 43.

CONNECTICUT

Fairfield Public Schools
Fairfield, Connecticut

Dr. Bette J. Del Giorno
Science Consultant
Fairfield Public Schools
100 Reef Road
Fairfield, Connecticut 06430

Description: The program at the elementary level is An Interdisciplinary Approach to Science Study; at the junior high school level, An Integrated Approach to Science Study.

The following six subprograms are in preparation in the Fairfield Public Schools. The descriptions include a statement of the philosophy underlying each program.

1. SCHOOL YARD LABORATORY (K-6) in 14 elementary schools throughout fall and spring to use the school yard facility to study the environment.

2. RIVER LABORATORY STUDY (3-6) in 14 elementary schools throughout school year. This is an offering that introduces the youngster to the important ecological relationships of the river and the surrounding areas. It provides practical, field study experiences and is designed

to focus on the importance of the natural resources in that particular system. The onsite experiences will be enhanced through preliminary and follow-up classroom activities. This offering may be a youngster's first and last exposure to the value of conservation efforts; and as citizens of tomorrow, these young people will vote on legislation regulating the use and misuse of our natural resources. One must first understand - through education - before one can make intelligent decisions.

3. MARINE BIOLOGY AND OCEANOGRAPHY (K-6) at Pequot Elementary School throughout school year. The science curriculum is structured around a marine biology and oceanography core from which basic concept(s) and processes in science can be learned by both teacher and the student. The program is designed to involve teachers and students in ongoing curricular construction and provides them with the opportunity to make use of the aquatic environment in constructing a relevant program of study together. This is made possible through the use of the Research Team Approach to Learning (ReTAL). Man's immediate environment must be first understood before he can begin to solve problems in other areas of the country or of the world.

4. ECOLOGY (K-6) at Oldfield Elementary School throughout school year. This course deals with the interdependence of all living things with one another and with their environment. It is designed to provide the children with an opportunity for experiences with their environment. This will be accomplished by research, laboratory experiences, field trips, films, etc. It is important to develop a culture in which man recognizes his interdependence and his responsibility for maintaining his environment in a condition fit for living.

5. ENVIRONMENTAL STUDIES AND OPEN SPACES (K-6) at Mill Hill Elementary School throughout school year. This curriculum offers the students and teachers an opportunity to take advantage of the natural resources in the area and to use the open space property purchased by the town. The program is designed to involve the students and teachers in studying the environment, planning use of the open spaces and predicting consequences of such plans. The Research Team Approach to Learning (ReTAL) will be used in constructing the curriculum and in studying the basic concepts and processes in science. It is essential that citizens understand the importance of a quality environment and the wise use of the land and water areas.

6. SCIENCE AS AN INTEGRATED STUDY (7-8) at Tomlinson Junior High School throughout school year. This is a two-year integrated science curriculum for the junior high school students in grades 7 and 8. The two-year offering is divided into eight units and during the course of a year, all the 7th- and 8th-graders, are exposed to the same four units, though not

necessarily in sequence; and during the next year, all the students are given the remaining four units. Although the same units are studied by the 7th- and 8th-graders, the students meet together separately, that is, as a 7th-grade class and an 8th-grade class. No effort is made to group them according to ability except at the extremes.

The subprogram (program) is designed to afford each student with individual laboratory experiences (in and outside of class) in order to make the student more aware and more appreciative of his environment. This will be accomplished through in-school and out-of-school laboratory and research experiences, independent and team projects, large and small group instruction; through the use of print and nonprint materials and other library resources.

Materials: The following curriculum guides are in preparation:

1. School Yard Laboratory Study (elementary)
2. River Laboratory Study (elementary)
3. Marine Biology and Oceanography (elementary)
4. Ecology (elementary)
5. Environmental Studies and Open Spaces (with ReTAL -- elementary)
6. Science as an Integrated Study (junior high school)

DELAWARE

Outdoor Laboratory
Newark School District
Newark, Delaware

Mrs. Catharine Y. Bonney
Science Supervisor
or
Mrs. Beatrice T. Derickson
Teacher-Naturalist
both at
83 E. Main St.
Newark, Delaware 19711

Description: Newark's Outdoor Laboratory program operates in four gereral directions:

Pre-trip orientation in the classroom
Nature study at the city park
Indoor-outdoor study for grade 4 at the local science museum
Development of nature centers on individual school grounds

The program started as a project under ESEA Title III, ran its full three years with federal money, and has now been picked up by the district's budget. Its aims are:

To enhance instruction by giving children experiences with flora and fauna in a natural setting where the children can explore natural phenomena for themselves, but in a structured situation.

DELAWARE (Continued)

To incorporate the acquisition of knowledge of the historical background of the center and its immediate surroundings as well as the scientific truths of the area.

To further an interest in conservation education through direct observation of the desired effects of recommended practices as compared with wasteful conditions that might result from poor control of natural forces.

To have access to a site where the ecology of natural communities can be preserved and studied.

To keep acreage in and around urban areas for showing representative samples of the native landscape.

To develop in all who use the facility an awareness and appreciation of nature along with a respect for living things.

The program operates during the school year and includes all students in grades 1-5 with some trips for 6 and 7 of the middle school. On-the-site nature study is provided for kindergarten classes. A full-time teacher-naturalist provides the pre-trip orientation and directs the students during their outdoor experience. A trailer-office has been set up in the city park where most trips are held as headquarters for the teacher-naturalist. A curriculum guide has been developed, and a brochure is also available describing the activities of the program. The emphasis at each grade level is designed to supplement the science program for that particular group and fits the season during which the trip occurs.

A taped lecture illustrated with 100 slides can be borrowed through the Title III office of the Department of Public Instruction, Dover, Delaware 19901.

CURRICULUM GUIDE (K-5) OUTDOOR LABORATORY may be obtained from: Director or Information Services, Newark School District, 83 East Main Street, Newark, Delaware 19711, for $1.50. The Guide outlines activities for each grade K-5, giving objectives, media to be used, methods, and evaluation. The outline for fall experiences for Grade 1 is included in the Appendix.

FLORIDA

Marine Science Education Center
Mayport, Florida

Mr. Jack Berile
Project Director
Marine Science Education Center
Mayport, Florida 32233

Description: The Marine Science Education Center is a center designed to enrich the science program of the students in Duval County by giving the elementary and secondary students of the county experience in the marine science field at a place appropriate for such experiences.

The Center is primarily financed by federal funds. Specifically, it is a PACE (Project to Advance Creativity in Education) project funded under Title III, Elementary and Secondary Education Act of 1965. Duval County pays for the maintenance for the transportation of the students to and from the Center and for the salary of five instructors. Eventually the County will take over the entire expenses of the Center, and it will become a permanent part of the enriched science program of the Duval County School System.

All public, parochial, and private school students in Duval County, grades 6 through 12, are served by the Center.

The elementary school students visit the Center for one day, spending half the day in the laboratory doing work in the areas of biology, physics, and chemistry as related to the sea. The remainder of the day is spent collecting and identifying specimens at a local beach. Sixty 6th-graders visit the Center daily.

Presently, approximately 60 secondary students participate in activities at the Center weekly. These students are given the freedom to solve a problem of their choice through laboratory and field work at their own speed and depth.

The hope for the future is to increase the number of secondary school students served by the Center. This will be accomplished by sending resource teachers from the Center to the schools to aid in preparatory lectures and discussions, and then by bringing the students to the Center for the laboratory and field work necessary to the studies begun in their schools.

There will be a summer enrichment program for students entering the 5th and 6th grades, and a credit course for students entering the 12th grade.

At the elementary school level the program hopes to help the students become aware of the broad and fascinating field of marine science so that they may consider it as a vocation or avocation in the future, and to create enthusiasm in the students for marine science, for science and, indeed, for all learning.

FLORIDA (Continued)

At the secondary school level the aim is to encourage students already interested in marine science to continue their pursuit of the field and to give them an opportunity to receive firsthand experience in the field of oceanography.

In addition, the program hopes to inspire schools to include marine science permanently in their curriculum.

In the future the program may be expanded to include all grade levels and to have regular evening courses for adults as well as students.

Environmental Sensitivity Project
Environmental Studies Center
Pensacola, Florida

Mr. Roy L. Hyatt
Director
Escarosa Nature Center
2501 N. Hayne Street
Pensacola, Florida 32503

Description: This Project is an operational application under Title III of Public Law 89-10 and is administered by the Escambia County School Board for the Escambia and Santa Rosa School Systems. The Project has been funded.

The Environmental Sensitivity Project aims to make ecology a vital and effective part of the elementary school curriculum in the cooperating counties. The program includes the establishment of training and experiences in environmental education for 2nd- and 5th-grade teachers. It will provide a preschool inservice workshop and year-round assistance for field trip planning. Also to be included are an environmental library and ecological museum. All outdoor lessons taught will be interdisciplinary in approach.

The program will operate 12 months in the year on a site of 600 acres of undeveloped University of West Florida Campus, 40 acres of beach area, as well as in other areas. The Center is located in a part of the elementary school.

Child-Structured Learning in Science
State University,
Tallahassee, Florida

Dr. Charles C. Matthews, Director
Child-Structured Learning in Science
Department of Science Education
State University
Tallahassee, Florida 32306

Description: Child-Structured Learning in Science (CSLS) is a program which facilitates non-prescriptive, individualized classroom science activities. Strong emphasis is on the simultaneous humanization and individualization of

FLORIDA (Continued)

science activities for K-6 children. CSLS makes the assumption that "learning how to learn" is of major importance to the child and that self-actualized learning is a major goal of education. CSLS has the following goals:

1. To enhance the thinking ability of the child. It provides activities compatible with preoperational, concrete operational, and formal operational thought in pursuit of investigations of the environment or the solution of problems.

2. To enhance the child's belief that he can interpret and manipulate his own environment -- that he is a part of his environment and dependent upon it.

3. To facilitate for each child the development of a positive self-concept with regard to independent learning and the manipulation of his environment.

4. To facilitate individual development of interests, attitudes, personality, and creativity which enhance the continued development of individuality in the learner.

5. To facilitate the child's tendency to accept the existence of individuals who have ideas and values which are different from his own.

The components of a SCLS program include the following:

1. A "CSLS Supervisor's Workshop" is designed for the local supervisor of CSLS programs.

2. A one-week "Workshop for the CSLS Teacher" is the introduction to this program. This is conducted by members of the CSLS staff or by a local supervisor trained in a CSLS Supervisor's Workshop.

3. An inservice program for teachers includes bi-weekly 30-minute video-taped or filmed presentations. Each inservice presentation "covers" about ten CSLS classroom sessions. Presentations vary in format but include (in vaying sequence) the following:

   a. Accurate depiction for children
   b. "Live" classroom conversations -- both teacher-student and student-student
   c. "Appropriate" and "inappropriate" environmental learning conditions -- emphasizing teacher behaviours
   d. Depiction of various ways of using the environment

4. A "Guide for the CSLS Teacher" is a functional printed aid to the teacher who has developed her own CSLS rationale during the one-week workshop.

FLORIDA (Continued)

5. Assessment instruments are provided for use by the classroom teacher in monitoring the behaviors of children in the program and for feedback to the CSLS project.

6. Descriptive materials for parents are available.

7. The "Science Curriculum Assessment System" is a research instrument which combines the techniques of classroom interaction analysis and an adaptation of the research techniques of Jean Piaget. It is designed for evaluation of the CSLS program.

8. A classroom kit for children includes materials for 150 CSLS sessions. "Development teachers" have found that one session per day seems most appropriate. This suggests that the program for children "runs" for about 150 school days. For convenience the sessions are numbered 1-150 in the "Guide for CSLS Teacher."

9. Thirty prerecorded presentations (15 minutes each) for children are intended for use with each fifth CSLS session. These presentations are available on film kinescope or videotape.

ILLINOIS

A Coooperative Program in Outdoor Education
The Abraham Lincoln Memorial Garden and Nature Center
Lake Springfield, Illinois

Mrs. Jeanette Sayre
Board President
Lincoln Memorial Garden
Lake Springfield, Illinois 62707

Description: The aims of the cooperative program in outdoor education are to serve all the Springfield Public School students in grades one through 4 in promoting and fostering an understanding and appreciation of outdoor education, including ecology and conservation. Approximately 3600 3rd- and 4th-grade children will be provided with half-day field trips conducted by the Center naturalist annually in the fall and spring months. During the winter months, approximately the same number of 1st- and 2nd-grade children will be presented nature lessons by the naturalists.

The program will also serve scouts and adult groups as well as other grade-level groups upon request as permitted by schedule. The Center is open the year round.

Statement of aims as contained in Guide: Because of the demand and need for outdoor and conservation education, and because the board feels that this is the highest use of the land consistent with the original purpose of the garden, it will be the policy of the board to place the majority of its energies and resources behind the development and operation of programs in outdoor education, open to all members of the community, regardless of age, sex, race, creed, social, or economic status. The purpose of the outdoor and conservation

education programs will be to develop not only an appreciation of nature, but ultimately even more important, to develop the realization that man is actually a part of nature--of the natural environment, and that unwise decisions regarding our natural resources will affect the very quality of human life. ----The greatest emphasis in outdoor education programming will be for school and youth groups.

Other features of the program are:

1. The school program is closely integrated with the science program, Concepts in Science, with emphasis upon conservation and ecology.

2. A curriculum Guide has been developed and made available to all schools served.

3. In-service workshops for graduate credit are held annually for area teachers.

4. The programs usually are conducted at the 55-acre nature center or during the winter at the various schools indoors.

5. The program is jointly supported by the Memorial Garden Foundation Board and The Springfield Board of Education, District 186.

INDIANA

Outdoor Education
Indianapolis Public Schools

Dr. Magdalene A. Davis
Indianapolis Public Schools
120 E. Walnut St. R 502
Indianapolis, Indiana 46205

Description: The program takes place near the schools, at a nearby camp, and in parks and includes the following:

Year-round day program	K-12	All city parks and scout camp areas
Summer program, 6 weeks	Grades 4, 5, and 6	Eagle Creek-Geist Reservoir
Resident program	Grade 6	Brown County Bradford Woods

Wildlife study, conservation, nature appreciation, and astronomy are among the topics covered.

Inservice training and teacher workshops are a part of the program as are preparation and follow-up for the students.

Materials:				
Outdoor Education Handbook	6th grade	Objectives	50 cents
Outdoor Education Planning Handbook	6th grade	Preplanning for trip	25 cents

INDIANA (Continued)

Honey Creek High School
Vied County School Corporation
Honey Creek, Indiana

Mr. Alfred Johnson
Honey Creek High School
6215 Honey Creek Road
Terre Haute, Indiana

Description: The program includes grades 10, 11, and 12 for 4 hours a day for 8 weeks. The aims are to encourage students to become acquainted with the outdoor environment and to develop an appreciation for their surroundings. Activities are carried out near the school and in park areas.

Activities include conservation, wildlife study, pollution problems, safety outdoors, stream and field study and identification, camp-out, special field trips, extended projects, and oral exams, with preparation and follow-up experiences.

Materials: Curriculum guides have been developed.

Wesselman Park Outdoor Education
Harrison High School
Evansville-Vanderburgh School Corporation
Evansville, Indiana

Mr. James Schwengel
Harrison High School
Evansville, Indiana

Description: The park development as an outdoor classroom is a community and school project.

Materials: Materials for the project were written by local teachers. They include a resource guide (with slides illustrating ecological developments) for use in grades 1-12 to help students understand the uniqueness of Stockwell Woods in Wesselman Park. The guide provides background material and techniques for encouraging students, individually or in classes, to explore this area. The slide and lecture materials are of professional level, and the written guide is unusual in its scope. Each season is covered by highlighting the ecological changes a student would observe.

INDIANA (Continued)

You and the Environment
John Marshall School
South Bend, Indiana

Mrs. Elizabeth Wiley
John Marshall School
1433 Byron Drive
South Bend, Indiana 46614

Description: This is a program of varied activities during the year. During the past year, all of the K-8 teachers worked to acquaint the student with our environment and the major problems affecting it. The Izaak Walton League film, "Too Thick to Navigate, Too Thin to Cultivate" was shown to grades 5 to 8. Following this presentation a guest speaker discussed water pollution.

October, November, and December were devoted to an across-the-grades study of conservation and environmental control.

In January an industry speaker spoke to grades 5 to 8 on the industry's mechanical methods of fighting air pollution.

During the first two weeks in February the school held a school-wide slogan contest, stressing the anti-pollution theme. Prizes were given to winners in groups K-3, 4-6, and 7-8.

March and April saw the students cleaning up the school environment -- outdoors and inside. May was school beautification month. The student council had a tree and flower fund drive for plants for the school grounds.

IOWA

Handicapped Children's Nature Study Center
Muscatine-Scott County School System
Bettendorf, Iowa

Dr. Paul Staskey
Alpine Center
Bettendorf, Iowa

Description: The Handicapped Children's Nature Study Center is a demonstration project to research and explore the benefits of outdoor education for the handicapped. It is an addition to Muscatine-Scott County School System's "Center for Children with Learning Problems" and the United Cerebral Palsy Association of Scott County's Preschool.

The project is a Title III (National Defense Education Act) project in the second year of development. Curriculum materials, inservice workshops, and use of the groups are being provided to 19 school districts in 5 counties as a part of the Muscatine-Scott County School System -- a Regional Educational Service Agency.

IOWA (Continued)

Outdoor Education
Bettendorf Community Schools
Bettendorf, Iowa

Mr. Don W. Jurgs
Director of Outdoor Education
Bettendorf Community Schools
Bettendorf, Iowa 52722

Description: The following special programs are offered:

1. Nature schools in outdoors - Grades 1-4 (summer) 1 week

2. Tent camping program - Grade 8 (summer) 1 week

3. Resident outdoor school - 6th grade (fall) 1 week

4. Resident outdoor school - 7th grade (winter) 2 days

5. Title I (Public Law 89-10) Gardening Program (summer)

When special programs are not operating, two outdoor education teachers and two buses are available for field trips for all classes in the school system. The field trip program ranges in activities from visits to woodland areas with kindergarteners to extended work in the out-of-doors with 7th- and 8th-graders. The field trip program has included visits to museums, farms, skiing for high school seniors, and tree-planting activities.

The P^3 Course
University High School
University of Iowa
Iowa City

Dr. Robert E. Yager
Head, Department of Science
The University of Iowa
Iowa City, Iowa 52240

Description: P^3 stands for semester course entitled "Problems of Population and Pollution," offered during the 1969-70 academic year at University High School. The course was described as one in which the students would be involved in individual activities concerning the problems of population and pollution. About 25 percent of the students in grades 10 and 11 elected the course. Topics were kept as current as possible with readings taken from magazines, newspapers, and a collection of the current books on the ecological problems.

The theme of the course was "the environment we want." The students were all asked to contribute to this definition. Each then chose a problem area that seemed to be preventing our reaching this goal. The students were encouraged to appear before community groups to discuss their concern and the results of their investigations and to express their desires for corrective or new actions. Visitors from other classes and resource speakers from outside were frequent in the classroom.

IOWA (Continued)

Every student was expected to be involved in at least one individual investigation. In practice two or three students often collaborated upon two or more. These investigations ranged from a check-up of the utterances of government officials regarding P^3 to opinion polls, study of seasonal changes in nearby lakes and river, clinical tests of water samples, and problems of population control in a ghetto environment.

The students were asked to evaluate all phases of their work in the class. The students were responsible for determining their grades and justifying their recommendations.

KANSAS

Science and Survival
Shawnee Mission South High School
Shawnee Mission, Kansas

Mr. Richard G. Dawson
Shawnee Mission Environmental
Science Laboratory
5800 W. 107th
Shawnee Mission, Kansas 66207

Description: This is a one-semester course for juniors and seniors, emphasizing current environmental problems, citizens' action, and basic ecological concepts. Students plan and execute environmental communications projects in all media, evaluate visual and written and sound communications. Guest speakers come from agencies and industries and research institutions. Field trips are included in the activities. The course accommodates 135 students per year and is self-graded by the students within a pass-fail framework. The Population Bomb by Paul Ehrlich and Science and Survival by Barry Commoner are used as texts.

Materials: Twenty-page outline of the behavioral objectives of the course, plus schedule, communications, and tests, is available, $1.

Shawnee Mission Environmental
Science Laboratory
Shawnee Mission South High School
Shawnee Mission, Kansas

Mr. Richard G. Dawson
Shawnee Mission Environmental
Science Laboratory
5800 West 107th
Shawnee Mission, Kansas 66207

Description: The 20-acre outdoor laboratory adjacent to the senior high school includes field, pond, stream, and woodland. It is used primarily by 10th-grade students. Small-group projects run from two days to five days in length, studying and comparing natural systems, plus experimental treatment of land. The program includes 800 students per year, with 14,000 student hours, primarily in a general biology course. There is

a six-man staff of biology teachers. Tours are conducted for other district schools and youth groups. The site has intensive use by 400 students per day in fall and spring, less in winter. A prairie dog colony is being constructed, along with fertilizer, burning, mowing, and gardening experiments. Summer biology course, also. Weather station reports to Weather Bureau.

Materials: A 60-page operations manual, $1.50.
Periodic newsletters available.
Laboratory exercises for field are being written and tested for future publication.

MASSACHUSETTS

Ecology
Randolph High School
Randolph, Massachusetts

Mr. Herbert A. Wolfer
Science Coordinator
Randolph High School
Randolph, Massachusetts 02368

Description: This is a full-year ecology course of seven periods per week, with 2 double labs, which has been in operation for the last 4 to 5 years. Content includes study of wildlife, earth science, conservation, marine biology, pollution, and safety outdoors, and is being continually upgraded and improved. Activities take place near the school. Many reading materials are employed with the most widely used text being Benton's Field Ecology and Biology.

Materials: A curriculum guide, which is to be revised during a 1971 summer workshop.

MARYLAND

Outdoor School - Grade 6
Outdoor Education School - Grade 8
Frederick County Board of Education
Frederick, Maryland

Mr. David Marple
Principal, Outdoor Schools
Frederick County Board of Education
115 East Church Street
Frederick, Maryland 21701

Description: The Outdoor School (grade 6) is a resident, five days and four nights, program for 1500 6th-grade students, their 50 teachers, and the 200 high school and college counselors. The Outdoor School is held at Camp Greentop, which is owned by the National Park Service, with a staff of one principal, five staff teachers, four cooks, one nurse, and one handyman. It is in operation 16 weeks a school year, September-October, and April 5-June 6. The aim of the School is to enrich the classroom experiences by providing firsthand geology,

charcoal and native plant sketching, study of forest, stream, and waterfall, history of the area, firetower, cook-out and campfires, astronomy, and games in the woods, as well as experiences in social living. Conservation and pollution are talked about and lived. There is much hiking with map and compass.

The Outdoor Education School for grade 8 serves 1,000 8th-graders and their teachers, mostly earth science teachers. They spend three days and two nights at Mar-La Ridge Camp, Jefferson, and Lutheran Church Camp. This program is open from November 15 to March 15 of each year. Among the topics studied are the pollution of the Potomac River and Catoctin Stream, geology of ridges, and of the Potomac and Catoctin; history of the C&O Canal and Harper's Ferry (with assistance of the Park Ranger); astronomy; firsthand study of rocks, minerals, erosion, mountain building; social living.

One Day Field Study program for grades 1 to 5 is held on the Frederick City Watershed and Gambrill State Park from 9 a.m. to 3 p.m. Thirty students, a teacher, and often an Outdoor School staff member take part in the day's field study. Topics include geography, view of valleys and mountains; and geology, rocks, mountains, animal and plant study in the 8,000-acre woods. Pollution and water study as it is related to the city reservoir are also included.

Teachers receive inservice training, and students have both preparation and follow-up activities.

Further details are included in the Appendix.

Materials: New curriculum guides are being developed.
The State Board of Education Resolution is included in the Appendix, p. 47.

Outdoor School
Allegany County Board of Education

Mr. Kendrick Y. Hodgdon
Supervisor of High Schools
108 Washington Street
Cumberland, Maryland 21502

Description: Aims and Objectives.

Social:

1. A living together experience
2. Care of clothing and body
3. Making new friends
4. Participating in campfires or programs

MARYLAND (Continued)

Science:

1. Learning appreciation of beauty of nature
2. Learning appreciation of and respect for nature
3. Learning how to live with nature
4. Learning conservation of natural resources
5. Learning more about parts of nature
6. Learning the relationships of all living things to each other.

Physical Education-Recreational:

1. Developing physically and emotionally
2. Learning new games and activities
3. Developing good personal habits

The program has been in operation since 1965 and was an outgrowth of a volunteer program started in 1946 by a group of teachers taking 5th-, 6th-, and 7th-grade students to Pleasant Valley for a week after school closed in June. The program operates approximately seven weeks in the fall and five weeks in the spring. Camp facilities are rented from the University of Maryland at Pleasant Valley in Garrett County. All 6th-grade students are eligible to go and over 93 percent of them went last year. The county pays half of the cost of the experience. The students pay $6 for the week.

The camp is staffed by three different experienced people each week. It includes a nurse, three cooks, teachers of the classes involved, and 12 counselors from the local high schools. The main staff of three teachers is chosen from approximately 12 teachers, principals, or supervisors who are all experienced with the program. This program is coordinated through the office of the high school supervisor.

A letter to the parents includes the following information:

"The Outdoor School is regarded as a laboratory for direct learnings in the areas of the natural sciences, conservation of natural resources, the social sciences, democratic living and citizenship, worthy use of leisure time, health, and physical fitness. The emphasis in the program is that nothing is taught in the Outdoor School curriculum which can be taught better in the classroom. Educators in Allegany County believe that this outdoor educational experience will be a valuable one. The challenge offered to these young people by this type of 'learning by doing' program is a step in the direction of better education for all our children and youth."

MARYLAND (Continued)

This year the camp was opened for a week's experience with special education children. It was such a success that it will be extended next year.

Preparation and follow-up are part of the program.

Materials: Curriculum guides have been developed. A sample schedule for a day appears in the Appendix, page 48.

MICHIGAN

Outdoor and Environmental Education
Wayne Community Schools
Wayne Michigan

Mr. John E. Snyder
Science Coordinator
Wayne Community Schools
Wayne, Michigan 48184

Description: The books, Conservation Education, published by J. H. Ferguson Publishing Company, are used. The volumes for grades 4, 5, 6, and junior high school are used in the science departments. Field trips are taken to selected trails and nature centers nearby by grades 1, 4, and 7. The schools also operate a summer outdoor education and camping program, and resident camping for the 6th grades. The high schools teach classes in environmental conservation.

The schools are developing a nature center within the school district and writing a program for its use. This will be completed in about one year.

Man and His Environment: A course
in Science for the Science-Shy
Portage Northern and Portage Central
Portage, Michigan

Mr. Ellsworth Starring, Instructor
School of Education
University of Michigan
Ann Arbor, Michigan 48104

Description: The course is involved with four basic questions:

What is an environment?
What has happened to the environments of this planet?
What is happening to the environments of this planet?
What will happen to the environments of this planet?

Several subquestions serve these major questions. Exercises are oriented to each of these questions, making the course a doing-inquiry laboratory experience with the environments of man. The laboratory

experiences employ a specifically designed technique. Experiences are unified science exercises requiring activities involving many phases of science. The program includes preparation and follow-up for the students and is conducted near the school.

Materials: Curriculum guides have been developed.

Resident Outdoor School
School Farm and Garden Program
Barnyard Program
Battle Creek Public Schools
Battle Creek, Michigan

Mr. Larry McKown
Director of Science and Outdoor Education
Battle Creek Public Schools
Battle Creek, Michigan 49016

Description: The Battle Creek Public Schools own and operate a resident outdoor education Center on Clear Lake, 12 miles north of the city.

The Outdoor Center has a staff of five certified teachers and a director with a complement of cooks, custodians, teacher aides, counselors, and farm workers. The physical plant includes a lodge, director's residence, winterized dormitories, summer cabins, classroom laboratories, historical buildings, and a farm.

Approximately 6,000 elementary boys and girls participate in one or more of three major programs operating at the center.

These programs include a 35-week outdoor school season for 5th- and 6th-grade students who spend a week living in residence during the school year; a 26-week Farm and Garden Program for 3rd- and 4th-graders who come to the Center for half-day experiences once each week between mid-April and mid-October; and a Barnyard Animal Program for first-graders during the late spring.

The Outdoor School program focuses on concepts in ecology, geology, conservation, agriculture, and history. Children work under the direction of resident outdoor teachers.

The School Garden Program revolves around the planting, maintenance, and harvesting of school garden plots. Concepts in plant biology, soil science, conservation, and horticulture are emphasized.

The Barnyard Program is a touch, see, and smell experience with common domestic animals and their young. Concepts in animal reproduction and offspring care, coupled with man's use of domestic animals are two major concepts generated.

MICHIGAN (Continued)

Student teachers from Michigan State University, Western Michigan University as well as students from other colleges participate in the program as observers and staff aides.

Materials: Some descriptive literature is available on request. Inquiries should be directed to Mr. Larry McKown, Director, Science and Outdoor Education, School Administrative Offices, 73 Capitol Ave., N.E., Battle Creek, Michigan 49016.

MINNESOTA

Independent School District
No. 197
West St. Paul, Minnesota

Dr. Allen Klingenberg
Independent School District
No. 197
1037 Bidwell St.
West St. Paul, Minnesota 55118

Description: The District utilizes the Dodge Nature Center in the district. Students K-10 (with 11 and 12 in preparation) can utilize these outdoor facilities for the academic year, plus 6 weeks during summer school. These students engage in activities to study wildlife, ecology, weather, earth science, conservation, outdoor safety, biology, crops, pond life, soils, geology, planting and raising garden crops, etc. This is not a program per se, but the activities are integrated into the science and social studies programs. Since the Center is within the District, students can visit it several times during the year as program topics are developed.

As a sidelight, this spring the schools had a maple syrup display from tapping through "distilling." It is anticipated that this will become an annual exhibit.

Other districts are also encouraged to use these facilities, which are donated by the Irving Dodge Foundation for educational use.

Pilot Program in Environmental
Conservation Education
Minnesota Department of Education
St. Paul, Minnesota

Mr. John C. Miller
Consultant, Environmental Education
Minnesota Department of Education
4th Floor, Centennial Building
St. Paul, Minnesota 55101

Description: Minnesota has a legislative mandate which calls for a unified effort by the State Department of Education and the Department of Conservation to develop a kindergarten through 12th-grade inter-disciplinary curriculum which includes the production and implementation

or appropriate materials. The two departments will enlist the aid of organizations and individuals who are interested in and capable of helping develop a statewide program. Research and development of materials will be carried on in 1970-71 in the pilot program; in 1971-73 the total state-wide program will develop and be implemented.

In the spring of 1970, the Department of Education announced that "In order to initiate a model curriculum project in Environmental Education, certain pilot schools will be selected to help with the designing, inservicing and teaching of the prepared materials. To qualify as a pilot school, a school must be willing to commit itself to a total K-12 effort. This entails assistance in the development of materials, inservice workshop experiences and trial classroom teaching and evaluation.

The Environmental Education Newsletter issued by the Departments of Education and Conservation, uses the theme "Quality of Life Accomplished Through Environmental Education" and thus defines environmental education: "Environmental Education is an interdisciplinary instructional program involving the social, cultural, economic, and esthetic as well as the physical and biological aspects of man's environment. It is designed to enhance perception of the problems and ramification of man's impact on his environment and the ability of man and the natural system to adjust to the consequences of interaction."

MISSOURI

Good Friend Nature Wagon
Nature and Environmental Education
Lakeside Nature Center
Kansas City, Missouri

Mr. Daniel G. Dougherty
Director-Naturalist
5600 East Gregory Blvd.
Kansas City, Missouri 64132

Description: The aims of the programs are toward environmental awareness in child children, preschool to 6th grade.

Most of the programs operate year round, though the summer ecology classes for high school students are held only in the summer. Nature and environmental education programs center on guided nature walks, with emphasis on discovery and observation. Themes concern natural cycles.

The science clubs meet year-round on Saturdays and undertake pollution surveys, litter clean-ups, natural science study, soil conservations, erosion control, and study of other topics.

The Nature Wagon is a year-round program for young children in which native live animals are used in discussion and demonstrations of adaptation, community, and survival, along with family life and development. This program goes into the school room.

MISSOURI (Continued)

Environmental education workshops for educators are conducted on camp property and help teachers learn to use the outdoors and become aware of the environment along with their students; promote school science clubs to do pollution surveys; use outdoor classrooms; and encourage teachers to use all the public facilities available to the best advantage possible outside the classroom.

Natural Science Resident Camp
Parks and Recreation Department
Kansas City, Missouri

Mr. Richard G. Dawson
Parks and Recreation Department
5600 E. Gregory Blvd.
Kansas City, Missouri 64132

Description: The Camp handles three 10-day summer resident camp sessions with a total of 150 boys and girls, ages 10-15. The program includes staff-led field community studies, individual camper-chosen ecological research investigations in lab or field, films and speakers from local scientific groups, plus camping activities. The 350-acre site, wooden hill with stream and lake, also includes two day camps and another general camp program. It aims at firsthand experience to give appreciation of natural interactions. Equipment includes a 16-inch reflector telescope, laboratory building, and public nature center nearby. The camp is staffed by teachers, college students, and high school assistants and draws from the Metropolitan Kansas City area. Students pay $30 for the 10-day session.

Materials: Project Ideas in Natural History, 25 pages, $1.
Field Guide to Swope Park, 75 pages, $1.

NEW JERSEY

Applied Life Science
Park Ridge High School
Park Ridge, New Jersey

Mr. M. Zirkes
Chairman of Science
Park Ridge High School
Park Ridge, New Jersey 07656

Description: Applied Life Science is an activity-oriented approach to a study of the biological and environmental sciences. It is intended for those students who have not taken biology. Modern environmental problems, such as air and water pollution, will be studied. The students will be exposed to modern biological laboratory techniques currently in use, for example, blood typing and biological staining.

Extensive use will be made of the surrounding community.

NEW JERSEY (Continued)

This is a one-year course open to 10th-, 11th-, and 12th-grades. It will be given for the first time in September 1970.

Materials: A Curriculum Guide is currently being prepared.

Outdoor Education Programs
Millburn Township Public Schools
Millburn, New Jersey

Mr. Fred C. Laspe
Science Consultant
434 Millburn Avenue
Millburn, New Jersey 07041

Description: Millburn schools encourage the use of three facilities for the Outdoor Education Programs:

A. Schools (elementary, K-6) The immediate school grounds are used. Some have nature trails.

B. Township
   1. Taylor Park
   2. South Mountain Reservation (Turtle Back Zoo)
   3. Cora Hartshorn Arboretum (K-5). There is a planned program throughout the school year.

C. Resident Camp Program
   The 6th-grade resident program at the Central New Jersey YMCA Camp at Blairstown, New Jersey, a distance of 80 miles from Millburn. Each class stays two and one-half days. Fourteen classes participate in a planned program which lasts approximately four weeks.

D. Arboretum Activities -- one half day sessions with volunteer docents.

Schedules of the topics covered in the 6th-grade resident camp interdisciplinary program and the arboretum activities for grades K through 6 are included in the Appendix.

NEW YORK

Marine Science
Shelter Island High School
Shelter Island, New York

Mr. Gene P. Kinghan
Science Department Chairman
Shelter Island High School
Shelter Island, New York 11964

Description: The marine science course is open to students who have successfully completed a year of high school biology. The course begins in the summer months with field trips, basically for collections which are

then evaluated throughout the year. Presently a half-credit is given for completion, but this will soon be raised to a full credit, as the course is under revision. The course is centered around a biological theme with the concepts of chemical and physical oceanography woven in.

An in-depth study of the marine organisms is made, based upon the foundations received in biology the previous year. Organisms are maintained and studied in the school's marine aquaria (six in all), and they are reported on by graphing techniques. This enables the students to see the associations of the marine habitat's physical features to the biotic factors.

The group gives class talks twice a year on subjects of interest to the individual giving the lecture. Great depth of subject is covered in these discussions. Each member of the class must also do an original project on some facet of the marine sciences.

The school maintains memberships in almost every group that has an interest in the science, such as the American Littoral Society and the International Oceanographic Association. Most of the students take out their own memberships in such societies.

Besides collection and evaluation field trips, the group also travels to colleges and institutions that are engaged in the subject to get firsthand information and to see the scientist in his niche.

Materials: Curriculum guides have been developed.

Marine Science Discoveries
Shelter Island High School
Shelter Island, New York

Mr. Gene P. Kinghan
Project Coordinator
Shelter Island High School
Shelter Island, New York 11964

Description: Essentially the program is a survey of the marine sciences with emphasis on the biological and ecological aspects. It is open to students who have completed 7th, 8th, or 9th grades. The program runs for either the month of July or August and, because of space limitations, enrollment is limited to the first 25 students who apply.

Students collect, identify, and maintain, where possible, the local marine organisms from most of the major phyla. Films, field trips, and class lectures are integrated into the program.

An introductory test is given to evaluate the prior knowledge of the student, and this is followed by weekly tests on films, lectures, and field trips. A comprehensive final examination includes identification of organisms as well as questions on the above sources of information.

NEW YORK (Continued)

Besides local field trips, there are trips to the Sport Fishing Industry at Montauk, Long Island, and to the Marine Aquarium at Coney Island, New York.

Materials: Curriculum guides have been developed.

EPICS -- Environmental Problems for Individually Centered Studies
Tarrytown Public Schools
Tarrytown, New York

Mr. Gilbert A. Zinn
Elementary Science Coordinator
Tarrytown Public Schools
Tarrytown, New York

Description: This is a program for students in grades 5-12 that will involve school, industry, and community. In the summer school, in the planning stages are (a) 1 hour for grades 5-6, 7-8, and 9-12; (b) tours of local industry; and (c) seminars with local scientists and politicians.

There will be a variety of topics of interest to students, including pollution, conservation, ecology, drugs, etc. Levels of achievement for individual studies may lead the students to continue their efforts during the following year. Cooperation is being sought with a nearby college for the use of their environmental study facilities.

NORTH CAROLINA

Independence Outdoor Laboratory
Charlotte, North Carolina

Mr. Charles Vizzini
Coordinator
1967 Patriot Drive
Charlotte, North Carolina 28212

Description: The Outdoor Laboratory Program is a part of the proposed environmental education program. This program will be to develop three additional laboratories utilizing similar program material. One phase of the program will involve the horticulture classes in developing shrubs to be used in landscaping. Additional units on the history of the community are also being developed. The overall program is not being restricted to science.

The Outdoor Laboratory Program has the following aims:

Objectives of an Outdoor Laboratory

In an increasingly urban society, it is increasingly difficult for people to have direct contact with their natural environment. How then are our citizens to learn the values of the natural world and to appreciate their heritage of natural beauty? One answer is the outdoor laboratory, a school-

affiliated natural area dedicated to the interpretation of the natural world and its values to youth as part of the school curriculum. That this is the intent of the proposed outdoor laboratory was made clear in the original proposal:

> "A study of the student's environment made alive through bringing more of this environment into an instructional program is a major objective of the laboratory."

Educational Objectives

To increase knowledge and understanding of our natural world and man's place in it.

To foster sensitivity, perception, appreciation and sound conservation attitudes toward land and natural resources.

To develop, through direct experience in the outdoors, such skills as accurate observation, perception of interrelationships, the ability to "read the landscape", environmental concern, landscape appreciation and horticulture, and the expression of creative and reflective thinking through writing, sketching, landscaping and art.

Cultural Objectives

To teach good outdoor manners and conduct, and thus help to curb vandalism and juvenile delinquency.

To develop in young people a sense of appreciation, respect and reverence for all living things.

To promote better citizenship by stressing individual environmental responsibility and the need for individual action.

Method of Operation

The field trip program material is available to the teacher upon request. The packet of material (consisting of: Theme-Understanding Check List, Development of Theme, Continuing Activities, Reference Listing and Information Map) is delivered by courier at least three weeks prior to the field trip. After the teacher has previewed the material, the check list is returned with items checked for special emphasis, one week prior to the orientation (presented by the coordinator). The one hour field trip is conducted by the coordinator and usually two or three volunteer student guides (student guides have been previously trained for specific grade levels). After the field trip the coordinator returns to the classroom for a follow-up session. Each grade level visits a different part of the outdoor laboratory to alleviate repetition. The horticulture course is an integral part of the outdoor laboratory.

The curriculum themes for the Outdoor Laboratory Program, first grade through twelfth are included in the Appendix, Page 51.

OHIO

Environmental Problems
Lakewood High School
Lakewood, Ohio

Mr. Ronald A. Leesberg
Biology Department
Lakewood High School
Bunts Road at Franklin Ave.
Lakewood, Ohio 44107

Description: The school is just getting under way with developing a possible curriculum for use at the high school level that would be an interdepartmental approach to environmental problems. A unit or two may be ready for testing during this academic year as a part of a mini-course program.

Conservation
John Marshall High School
Cleveland, Ohio

Mr. Bruan W. Powers
John Marshall High School
3952 W. 140th Street
Cleveland, Ohio

Description: The conservation program is offered both semesters. It has been open to junior and senior boys, but is now to include girls. The high school also has a complete ecology program and through the years has completed many specific individual, group, and community projects. Curriculum guides have been developed for the program, and the students have both preparation and follow-up experiences.

Butler Conservation School
Butler County Schools
Hamilton, Ohio

Mr. Don Morris
Butler County Schools
3rd and Ludlow
Hamilton, Ohio 45011

Description: The Butler Conservation School is in operation for six weeks each summer. The purpose of the program is to provide a one-week session in outdoor education for 30 7th-grade students. Thus, 180 students are involved each summer. The school is held in one of the Butler County Parks under the leadership of a husband-wife team of directors. Students are housed in cabins in the park. Participating students are charged a $20 fee. Each participating school system provides a counselor for the week and a bus for use in transporting the students to various points of interest. Additional support, financial and otherwise, is provided by the Sears Roebuck Foundation, various chapters of the Izaak Walton League of America, the Butler Soil and Water Conservation District, and the Butler County Park District.

Many people from neighboring schools and from nearby Miami University serve as volunteer instructors in areas of their special interest.

OHIO (Continued)

Activities include the following:

History of the camp
Forestry
Farm conservation practices
Human resources
Fishing
Color-pollination
Creeking
Pollution
Log cabin village
Nature study
Swimming
Horseback riding
Museums
Algae
Hiking
Tree and plant identification.

OREGON

Outdoor Education
Washington County School
District #48

Mr. Ray Haag
Washington County IED
172 South First
Hillsboro, Oregon

Description: The program is for grades 1-6 to make use of outdoor learning situations which provide learning situations not available in classroom. Program for grades 1-4 is sporiadic but includes visits to several kinds of farms.

The grade 5 program culminates in a one-day field experience; this is preceded by and followed by appropriate planning activities.

Grade 6 students and their teachers spend a week living in a camp where they study with students from other schools. All aspects of the regular curriculum -- language arts, social studies, math, science, art, physical education -- are incorporated into the curriculum. Specialists are located at the camp sites to help teach about local materials or sites; these specialists are aided by youth counselors in the study areas of wildlife, plants, water, and soil. Classes are held in both fall and spring; there is extensive preparation and follow-through (from the outdoor experience) in the regular classroom.

The program also includes inservice training and teacher workshops.

Materials: Curriculum guides have been developed.

PENNSYLVANIA

Cooperative University-High School-
County Parks Program in Ecology
Pittsburgh, Pennsylvania

Mrs. Carolyn A. Gibson
Room 2633
Cathedral of Learning
Pittsburgh, Pennsylvania 15213

Description: The University of Pittsburgh High School Science Research Program will be conducted during the summer of 1970 (6 weeks) and the academic year 1970-71 in several high schools and with the field activities being held in the County Parks. It is a program of scientific research participation in ecology for teachers and high school students with instruction and supervision by ecologically oriented scientists and environmentally oriented educators. Emphasis for the high school students will be on developing an area for investigation, literature search, problem identification, experimental design, statistical evaluation, and final reporting. The background in ecology will be presented through lectures and field experiences. The teachers will apply these same procedures of original investigation to the development of a segment of an environmental curriculum in ecology to be used and evaluated during the academic year. The teachers involved will be enrolled in a workshop in secondary education at the University.

The students enrolled are from grades 7-12. Representative problems they will try to solve will include abiotic and biotic factors that affect the ecosystem they select. Instruction in such activities as mapping, oxygen and carbon dioxide determination, behavior of organisms, faunal surveys, aquatic surveys, and similar topics will be given in the University, high schools, and county parks.

A week of orientation at the University will precede the experimental activities. Included are lectures on experiemental procedures, succession, nuclear pollution, technics of ecological experiementation, careers in the environment, geology, soils, with time allowed for a beginning literature search and protocol writing. The teachers will be oriented to curriculum development and methodology of inquiry. Seminars with scientists and progress reports with peers are part of the program.

The next five weeks are spent at the high schools conducting the experiments, and with the field experiences being conducted for two days each week in the adjoining county parks. Experiments not completed during the summer may be completed in the fall term, or more studies started then; it is expected that the county parks will be sites for further studies, or that the school sites will be developed as outdoor laboratories.

Evaluation will be conducted continuously and will include a review of the curricular materials to be used by the teachers during the academic year. Dissemination of these materials will be planned for the use of interested teachers in schools of the area after evaluation of their effectiveness.

PENNSYLVANIA (Continued)

Southeastern Pennsylvania Outdoor Education Center
Rose Tree Media School District
Media, Pennsylvania

Mr. Larry B. Stratton
Director
Southeastern Pennsylvania Outdoor Education Center
Sycamore Mills Road
Media, Pennsylvania 19063

Description: The Center is an operational grant program authorized and funded under Title III of Public Law 89-10 and developed and administered by the Rose Tree Media School District. Headquarters for the Center are located in the former Jefford's mansion in Ridley Creek State Park. Field study areas include several nature study trails and natural areas within the confines of Ridley Park. With the development of the State Park itself, several new natural study areas will become available to the program. Outdoor areas in the adjoining John T. Tyler Arboretum are also available to the program.

Primarily, the program serves Delaware and Chester Counties, whether the students are from public, private, or parochial schools. Some services are also provided for interested organizations outside of the two main service areas.

Program offerings are concentrated in the areas of conservation education, natural history, and environmental sciences, though other areas of the total educational program are not excluded. The permanent, full-time staff of the Center consists of a director, curriculum coordinator, field instruction coordinator, learning resource center coordinator, satellite center coordinator, teacher-naturalist, and secretary. Part-time staff members include naturalists, maintenance man, three Neighborhood Youth Corps enrollees and 25 community nature guides, as well as many temporary employees and consultants.

The functional philosophy of the program is expressed as follows: "Our Center dedicates itself to promoting the causes of total environmental education. We recognize the immediate need for a multi-faceted program of public education designed to promote the development of a citizenry well grounded in a working knowledge of their outdoor environment and committed to the cause of protecting and preserving those natural elements that constitute the components of that environment.

"We further believe that these objectives can best be achieved by working within the framework of the regular school curriculum to develop and incorporate outdoor education experiences which foster and promote a conservation conscience in the minds of our young people.

"In practice, out field-oriented educational experiences provide our student praticipants with the opportunities to discover for themselves the marvels and truths of their natural environment, always stressing the use of the senses as the basic tools of learning."

PENNSYLVANIA (Continued)

Programs at the Center include:

1. Field trips for the students with advance materials sent to the teacher before the trip.

2. On-site school survey program designed to promote teacher use of their own school grounds as sites for interesting and meaningful field trips. Center staff will visit the schools, survey the flora and fauna found there, and develop, write, duplicate and distribute self-guiding field trip guides for each school site.

3. Inservice program includes presentations to many groups, such as parent groups or science and conservation clubs as well as to teachers.

4. Consultant services program for schools and districts wishing to develop their own programs.

5. Teacher training program, with summer courses given for college credit through West Chester State College, and programs of outdoor education experiences for students majoring in education.

6. Curriculum Development Program, which has produced a series of nine curriculum guides for teachers in the areas of art, language arts, mathematics, social science, and natural science for grades K-12.

7. Newsletter of general information for persons interested in the Center's activities.

8. Evaluation efforts that attempt to measure changes in attitudes toward the outdoors in the student participants.

The Center also has under way a program of high school student research and an academically talented student program as well as an audiovisual materials development and an ecology program in cooperation with Villanova University.

PHILIPPINES

Conservation Consciousness
National Biology Teachers Association
of the Philippines
Manila

Brother Alfred FSC
De La Salle College
2401 Taft Ave.,
Manila, P.I.

Description: We are trying to have each province and city adapt a local bird, tree, and flower. So far, three have done so. We are trying to have the "virtues" of these taught in the grade schools to inspire the nation to think of conservation.

PHILIPPINES (Continued)

Those of us in the program are always talking conservation to government and school officials. We are also working with the parks and Wild Life Bureau of the National Government.

Progress is being made, but it is very slow.

SOUTH CAROLINA

People and Environment
State of South Carolina

Mr. John Y. Jackson
Conservation Consultant
801 Rutledge Building
Columbia, South Carolina 29201

Description: "People and Their Environment -- Teachers' Curriculum Guide to Conservation Education," which was written under the coordination of Albert H. H. Dorsey of the State Department of Education, and Matthew J. Brennan of the Pinchot Institute for Conservation Studies, has been distributed to all schools in the state.

At present, workshops are being conducted to familiarize the teachers with the "People and Their Environment" series as well as other environmental education ideas. Plans are also underway to produce some instructional television films for inservice showing to teachers in an effort to reach more teachers than can be reached by individual school workshops.

In February 1970, the State employed a conservation/environmental education consultant to

1. Conduct inservice teacher workshops and training sessions concerning conservation/environmental education

2. Work with school administrators and boards of education to promote conservation/environmental education

3. Help plan outdoor laboratories on school sites

TENNESSEE

College-Elementary School
Conservation Camp
East Tennessee State University
Johnson City

Mr. John H. Bailey
Secretary
East Tennessee State University
Johnson City, Tennessee 37601

Description: The program includes an off-campus school camp of one week's duration. Group living is a part of the program as are learning the concepts of conservation and studying soil, water, wildlife, and safety.

TEXAS

Austin Natural Science Center
Austin, Texas

Miss Sandra H. Foster
Acting Director
401 Deep Eddy Avenue
Austin, Texas 78703

Description: The Center offers natural science classes, traveling exhibits, guided tours, animal lending library, etc.

The organized activities encompass many disciplines of natural science; e.g., mammology, entomology, limnology, geology, etc., also including conservation, art, ecology. Activities are designed to stimulate interest in and concern for, our natural resources by offering an opportunity for firsthand involvement and discovery through observation, fieldwork, and experiments.

One fall, one spring, and four summer sessions of activities are offered for persons preschool (four years old) through senior high school. Each session consists of 12 to 18 classes (each with 12 to 15 students) which meet 9 times during the session. The classes average three field trips per session with an overnight for 5th- through 12th-grades.

Adult programs include lapidary classes; an astronomy club and class; and family field trips.

Content of the class is determined by the instructor, although there are class outlines which teachers may follow if they prefer.

Field Ecology
Dallas Public School
Dallas, Texas

Mr. Jesse M. Harris
Dallas Public School
3700 Ross Avenue
Dallas, Texas 75204

Description: The field ecology course for advanced biology students (11th- and 12th-grade) was introduced into the curriculum to fill a growing need for environmental study as it related to biology. The first year of the course was completed at the end of the school year 1969-70. The ecological approach of this course is designed to enable the students to move out of the classroom and into the field and observe nature in all her many facets. A selection of a central location for these activities allows much greater use to be made of community resources. The Museum of Natural History was chosen as the basic headquarters for the class, and students from 20 high schools around the city were selected to form the class. Each student was in his home school one half day and in the field ecology course the other

half day. Many field trips with overnight stays were conducted. The teacher and the Museum staff cooperatively conduct classes both in and out of the Museum. Other sites for the program activities are near the school, at a camp, and in a park.

Outdoor Education
Tyler Public School
Tyler, Texas

Mr. C. S. Story
201 East 11th St.
Austin, Texas 78711

Description: Outdoor education is available to every 5th- and 6th-grade boy and girl in the elementary schools of Tyler. The 5th-graders are in camp two days and one night, and the 6th-graders, three days and two nights. The education actually begins a few weeks before the outdoor experience as teacher-pupil planning takes shape, and extends beyond the camp time into the evaluation afterward.

Along with Camp Tyler, a popular type of experience is the school farm. Children learn about and care for farm animals, observe good practices in land management, and get some appreciations for rural living.

Since its beginning in 1949, outdoor education in Tyler has been considered as an aspect of general education, placing special emphasis upon those elements of the elementary curriculum which can best be learned by direct experience in a group activity, outdoors.

VIRGINIA

Seventh Grade Life Science
Norfolk City Schools

Mrs. Mariana R. Becker
Science Supervisor
735 Pembroke Avenue
Norfolk, Virginia 23507

Description: This is an activity-centered life science program stressing the ecological approach. Seventh-grade students in the Norfolk schools are enrolled in this class every day throughout the school year.

The program encompasses an introductory unit on the ways of a scientist and the differences between living and nonliving things; a unit on the community, including specific kinds of community such as fresh water, marine, and land; a unit on dynamics of living things (energy relationships and the maintenance and continuity of life). The last two units are concerned with interrelationships (individual, social, and the community) and with man's relationship with his environment.

VIRGINIA (Continued)

Field experiences are offered to the extent possible, particularly in the immediate school surroundings.

The program is held near the school, includes inservice training and teachers workshops and preparation and follow-up activities for the students.

Materials: Curriculum guides have been prepared.

Nature Activities
Prince William County Recreation Department
Manassas, Virginia

Mr. Howard Thompson
Prince William County Recreation Department
209 Hampton Road
Manassas, Virginia 22110

Description: The aims of the program are to bring the children into contact with organisms and other features of nature (awareness).

The program will be four weeks long, with nature activities on two days per week. The students will make one visit to Prince William Forest Park. The grade level is grades 1 to 6.

Specific activities include wildlife study, homes of animals, food web, birds, tracks; conservation; pollution in area around the centers; plant study, seeds and flowers; preparation of nature studies, making aquarium, terrarium, ant farm, and earthwork farm. In the trip to the Park the students will take a hike and see many different phases of life in a living forest. Activities take place near the school and in the Park.

Inservice training and teachers workshops and preparation and follow-up activities for the students are carried out.

Materials: Curriculum guides have been developed.

WASHINGTON

Environmental Education
Shoreline School District
Seattle, Washington

Tony Angell
Coordinator of Environmental Education
Shoreline School District
N.E. 158 th and 20th, NE
Seattle, Washington, 98155

Description: The Environmental Education program is comprehensive K-12. Almost all of the District's 19 elementary schools participated, with the 5th- and 6th-graders in 2½-day environmental education experiences at either Moran State Park

on Orchas Island or Warm Beach Camp at the mouth of the Stillaguamish River. Science classes in the secondary schools utilized the Whidbey Island environmental education site, as did other subject areas following the interdisciplinary approach to environmental education.

The elementary schools likewise use the immediate school grounds and the adjacent park facilities for environmental experiences at all levels. Particular curriculum guides have been developed for this purpose. At this time the programs are becoming more concrete through the writing of specific objectives for each grade level and through the writing of planned use catalogues for outdoor sites.

The school curriculum provides the framework for an interdisciplinary approach to the subject. The ecological conscience is explored in not only science but the ecology in literature, psychology and sociology, social studies and art. The latter studies are most comprehensively developed in the secondary schools.

Inservice training and teacher workshops are part of the program, as are preparation and follow-up.

Materials: Curriculum guides have been developed.

WISCONSIN

Guide to Environmental Education
Madison Public Schools
Madison, Wisconsin

Mr. Marvin Meissen
Science Supervisor
Department of Curriculum Development
Madison Public Schools
P.O. Box 2189
Madison, Wisconsin 53701

Description: The Guide to Environmental Education: Conservation of Natural Resources was developed by the Conservation Committee of the Madison Public Schools. The Guide was designed to serve as a tool which teachers may use to incorporate into their instruction basic principles concerning the conservation of natural resources. Material in the guide has been divided into sections on soil, water, minerals, wildlife, plants and scenic, historical or recreational areas. Each section lists concepts, learning activities, possibilities for correlation with other subject areas, and appropriate materials for each of these levels: primary, intermediate, and upper grades.

Geo-Ecology of Wisconsin
Madison Public Schools
Madison, Wisconsin

Mr. Marvin Meissen
Science Supervisor
Department of Curriculum Development
Madison Public Schools
P.O. Box 2189
Madison, Wisconsin 53701

Description: The Geo-Ecology of Wisconsin is a lecture, seminar course of 14 weeks open to all students. It is one of a series of short courses at James Madison Memorial High School. Its major purpose is to develop an appreciation of the ecology of the state of Wisconsin and to indicate how the different regions developed, through a geologic history of Wisconsin. The present and future geo-ecological status is discussed with reference to man's influence on the environment.

The course is a noncredit elective open to students from grades 10 to 12. One of the purposes of this as with the other short courses is to stimulate independent study in related areas.

Materials: A curriculum guide has been developed for the course.

Science and Society
Madison Public Schools
Madison, Wisconsin

Mr. Marvin Meissen
Department of Curriculum Development
Madison Public Schools
P.O. Box 2189
545 West Dayton Street
Madison, Wisconsin 53701

Description: The Science and Society unit is being taught as a one-semester credit course at James Madison Memorial Senior High School. The unit attempts to expose the individual to some of the major problems confronting him in his environment, help the individual become aware that science can aid in finding answers to society's problems, and instill in the individual a belief that the scientific community has a sense of responsibility and commitment regarding the individual and society. The materials dwell on the interaction of man and his environment, how man is modifying his environment, and how the changing environment is affecting man.

The course is open to any 11th- or 12th-grade student.

Materials: A resource unit is available.

MISCELLANEOUS

Life Science Investigations
Educational Research Council
of America
Cleveland, Ohio

Mr. James Joseph Gallagher
Director, ERC Science Program
Educational Research Council
of America
Rockefeller Building
Cleveland, Ohio 44113

Description: Life Science Investigations is a one-year course of study in the life sciences, designed for 7th-grade students, which deals with the interrelationships among living things and man's influence on his environment. The instructional approach is essentially student investigation. Simulations and games are also provided, such as "A Pollution Game," "Thermal Pollution," "The Redwood Controversy," and "Planet Management."

Habitat & Resources
Association of American
Geographers
Washington, D.C.

Association of American
Geographers
1146 Sixteenth St., N.W.
Washington, D.C. 20036

Description: Habitat and Resources is a part of the High School Geography Project of the Association of American Geographers. In the unit, which requires between five and seven weeks teaching time, the major emphasis is on the interaction of man and his natural environment. One of the activities compares two areas, the Salton Sea area of California and the Nile Delta, which are very similar in their physical characteristics but quite different in the way man has modified the natural habitat. Another activity indicates the influence of geological characteristics on the transportation routes, farming, and settlements of an area.

A number of activities focus on problems associated with man's use of his environment. One deals with flood hazards. Students analyze a manufacturing firm's flood problem and play a simulation game in which they assume the roles of company executives and town citizens who, based on their own needs and interests, recommend adjustments the firm should make to prevent flood damage. Another activity deals with the concept of water balance and its relationship to river pollution. In the final activity, New York City serves as the case study for analyzing the problems of pollution and waste. Students learn how waste disposal decisions can affect ecological balance.

Materials: Habitat and Resources is one of six units developed by the High School Geography Project. It is now available from the Macmillan Co., School Division, 866 Third Ave., New York, New York 10022. $83 for a classroom set for 30 students. (This price is subject to change by Macmillan.)

SUPPLEMENTARY SOURCES

of Information about Environmental Education Projects

PACE (Projects to Advance Creativity in Education)
Title III, Supplementary Centers and Services Program
Elementary and Secondary Education Act of 1965

Descriptions of the projects funded under Title III are included in bibliographies issued by the Office of Education under titles such as PACE Outdoor Education Projects, and PACE Marine and Oceanography Projects and by the Government Printing Office under the title, Pacesetters in Innovation (The Fiscal Year 1968 edition, for example, is priced at $2.50.)
Order from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

ERIC (Educational Resources Information Center)
The ERIC Clearinghouse centers assemble materials on research and educational projects in specific areas. These are then available in microfiche or hard copy through the ERIC Document Reproduction Service, The National Cash Register Company, 4936 Fairmont Avenue, Bethesda, Maryland 20014

The ERIC Center for Science and Mathematics is located at the Ohio State University, Columbus, Ohio 43221.

APPENDIX

COLORADO

James N. Metzdorf
Consultant, Science
Colorado Department of Education
Denver, Colorado 80203

Activities in Environmental Education - (a brief abstract)

I. The interest of the Colorado State Board of Education is indicated by the following excerpts from the Proclamation on Environmental Education adopted at its meeting, March 10, 1970:

> "WHEREAS, education must assume responsibility for encouraging positive citizen attitudes which will help improve the quality of our environment,...BE IT RESOLVED, that the Colorado State Board of Education...Urges educators and school systems to develop and implement instructional programs of an enduring nature that include school action projects designed to halt and correct environmental deterioration; and directs the Colorado Department of Education to maintain in its continuing inservice education programs with local school districts and educators in the state a prominent emphasis on environmental education."

II. Through the concerted efforts of our social studies consultant, Mr. George Ek, and our consultant in conservation, outdoor education and environmental programs, Mr. Chuck Holtzer, the Department of Education cooperated in distributing a packet to every public school in Colorado which contained information pertaining to Earth Day, April 22nd. This packet contained information from the Colorado Institute on Population Problems which were put together by our state senator, John R. Bermingham, called "The Populations of Two Spaceships." It also had a cover letter and information from the Rocky Mountain Center on Environment (ROMCOE), which is a non-profit organization, to coordinate, inform, educate, and help in research on environmental problems in the state. Also, several helps to the teacher which included some suggestions on improving the environment, a document on small group problem sessions, developed by Charles Holtzer.

III. There are presently at least fifteen embitious outdoor education programs being supported and conducted by local school districts in the state of Colorado. These programs are generally multi-disciplinary in nature and emphasize the use of the outdoor environment to support the education programs in the various content fields. Their direct link with environmental education is obvious and will continue to be emphasized to a greater extent.

COLORADO (Continued)

IV. Thirteen secondary schools in the state of Colorado are now using the Man-Made World in a multi-disciplinary fashion, which includes the strong possibility and encouragement from our inservice program to look at environmental problems in applying the engineering concepts of decision making, modeling, etc. This course, and its preceding teacher inservice, seems at this point to be the most promising program in our state, which sets out to tie together problem solving techniques from the various disciplines and environmental problems.

V. Several of our teacher-training institutions in the state of Colorado are offering summer programs to elementary teachers in the use of outdoor education and environmental education in their classrooms. Also in specific, Colorado State University, Colorado State College, and the Poudre School District are developing an on-site program to be used primarily for teacher inservice and for the use of students in a program which is located at Colorado State University's Mountain Environmental Center.

VI. Three Title III ESEA projects are either presently going, or have been completed, which have directed themselves toward environmental problems in many different ways. One was the Camp Bristol Project in the San Luis Valley near Alamosa, Colorado; another was an Outward Bound type of program at the Adams #14 School District; and the third one was tied into the previously mentioned teacher education program at Fort Collins, Poudre School District R-1.

VII. The Colorado Department of Education is providing coordinating service for many organizations within the state who are interested in environmental problems: Thorne Ecological Foundation which is located in Boulder, Colorado; Colorado Open Space Coordinating Council; Outward Bound, Inc.; Colorado Department of Game, Fish and Parks; Colorado Institution on Population Problems; and the Rocky Mountain Center on the Environment.

Curriculum Guide (K-5) Outdoor Laboratory
Newark School District, Newark, Delaware

GRADE 1 - FALL

I. OBJECTIVES

After this trip to the Outdoor Laboratory, the child should be able to:

Identify colors of fall leaves
Compare leaves that turn color and fall with leaves that remain on the tree
Compare leaf shapes with common shapes
Match leaves with seeds and perhaps a few trees
Name ways seeds travel
Distinguish between rough and smooth surfaces
Distinguish between soft and hard objects
Identify the odor of cedar and the spice bush
Name animals seen during trip
Distinguish between shadow and reflection

II. MEDIA

Filmstrips (from Central A.V. Library)

2098	Animals Have Homes
62	Animals of the Woods
757	Animals of the Woods
1473	Animal Pests
1307	Aquarium
1449	In the Autumn
1517	Autumn and Winter
2088	Autumn is Here
1888	Migration of Birds
1006	Earthworm, Our Friend
1753	Squirrel
254	Nature Cooperates with Man
1310	How a Plant Grows
886	Plant, What Makes it Grow
1456	Plants and Seeds
2103	Plants Change Through the Year
1590	Plants in the Park
1906	Plants, Wildflowers Everyone Should Know
1304	Rabbit
380	Jimmy Raccoon
173	Reptiles
1810	Seasons
1675	Seasons
885	Seed, What Makes it Sprout
1664	Seeds and How They Travel
859	Water in Weather

III. METHOD

Pre-Tour

Watch trees on school ground for change in seasons
Bring in leaves and seeds from home
Match tree and seed
Match the same shaped leaves and see if colors are the same
Keep the collection by pressing with iron between waxed paper or press between layers of newspaper and books; paste to paper backing
Crayon across leaf under a piece of paper, the veins and outline will show
Collect pictures of animals that live in the woods.

On-Tour

Observe squirrels, birds, mice, moles, ground-hog, spiders, insects, stream, trees
Listen to singing birds, running water, crackling leaves
Touch trees, rough bark of oak or gum, smooth bark of beech, hard rocks, soft moss
Smell spice bush and cedar
Compare leaves and nuts with common shapes
Compare plant growth in picnic area with growth on hill
Compare surface of stream before and after leaf is dropped from bridge
Distinguish between reflection and shadow

Post-Tour

Using the samples, describe how it feels when just touch is used
Select an object
Place objects under the proper picture or work
Use the nature box materials.

IV. EVALUATION

Using samples obtained on trip:

Place the leaf sample under the proper color
Classify samples according to shape by placing them under examples of some common shapes; i.e., triangle, circle, hand
Select smooth, rough, soft and hard items from objects out of sight in a box or bag

Point to a shadow

Point to a reflexion

Resolution
Maryland State Board of Education
January 28, 1970

Resolution No. 1970-15

RE: Institution of a planned program of environmental education in all Maryland elementary and secondary schools.

WHEREAS, Education is a process through which citizens understand their responsibilities for the conservation of the human environment; and

WHEREAS, Understanding and respect for the natural world and its complex balances must be developed and sustained; and

WHEREAS, Each student needs to develop an understanding of the ecological relationship of man to his environment; and

WHEREAS, The public schools have a responsibility for developing in each student an awaraness of his environment; now, therefore, be it

RESOLVED, That the State Board of Education supports the initiation of a program of environmental studies in all public schools of Maryland; and be it further

RESOLVED, That the State Board of Education urges the establishment of a program of environmental studies as a planned part of the curriculum in all elementary and secondary schools in Maryland.

Allegany County
CURRICULUM SCHEDULE FOR OUTDOOR SCHOOL
Western Maryland 4-H Center
Pleasant Valley, Swanton, Maryland

6:00 Voluntary Bird Walks as Announced

7:15 Rise and Shine - Cabin Clean Up 7:45 Flag Raising-Physical Exercises 8:00 Breakfast 8:45 Cabin Touch Up

Time	Monday	Tuesday	Wednesday	Thursday	Friday
9:00-10:00	Departure for Camp	Compass Orientation (A) X	Camp Craft (A) X	Planetarium and Fire Tower Classes in shore ecology Insects, Forest cryptozoa Flower identification Forest Fire Tools	Clean Up Cabins and Area
10:00-11:00	Cabin Assignments and Camp Orientation	Survival (B) X	Compass Hike (B) X		Student Evaluation with Teachers
11:00-12:00	Weather Forecasting (A-B-C)	Banding (C) X	Forest Management (C) X		Trapping+ Archery+ Casting+ Snakes+ Gun Safety+
12:00-1:00	Lunch	Lunch	Lunch	Lunch	Lunch
1:00-1:30	Bog Hike (A)	Bog Hike (B)	Rest Period		Departure for return trip to the school
1:30-4:00	Beaver Dam (B) Nature Hike (C)	Beaver Dam (C) Nature Hike (A)	Nature Hike (B) Bog Hike (C)		

Time	Activity
4:15-5:15	Elected games and classes-casting, archery, trapping, snakes, flower identification, field math
5:15-5:55	Shower and clean up for evening activities
5:55	Flag ceremony
6:00	Dinner
6:45	Class evaluation
7:45-8:45	Evening activities-astronomy, nature hunt, dramatics, campfire, safety
8:45	Snack
9:00	Vespers
9:30	Taps and lights out

Planetarium Trip
(A) and half of (B) - Reds
(C) and half of (B) - Blues

+ Choice
X Morning classes rotate in the three areas taught

52 48.

Millburn Township Public Schools
Millburn, New Jersey

Sixth-Grade Resident Program. YMCA Camp, Blairstown, New Jersey

SUBJECT MATTER AREAS

SCIENCE

1. Biology
2. Ecology (water, land)
3. Geology
4. Meteorology
5. Astronomy

LANGUAGE ARTS

1. Oral Reporting
2. Creative Writing (prose and poetry)
3. Note taking
4. Use of Reference Materials
5. Interviewing

ART

1. Color Harmony
2. Sketching Scenes
3. Perspectives

SOCIAL STUDIES

1. Conservation Practices and Pollution Problems
2. Land Characteristics and Uses
3. History of Local Area
4. Visit Farms - Migrant Labor
5. Group Dynamics

MUSIC

1. Motivational listening for Musical Sounds found in Nature
2. Appreciation
3. Group and Campfire Singing

MATHEMATICS

1. Computing Distances
2. Measurements - Metric System - Weights, Volumes
3. Map Reading - Map Making

HEALTH AND PHYSICAL EDUCATION

1. Hiking
2. Square Dancing
3. Sanitary Rules
4. Safety Regulations

Arboretum Activities - One-half day sessions with volunteer docents.

KINDERGARDEN - Trail Walk: Discovery Session
1. Observations)
2. Classification) Using the Senses
3. Hand Lens - Use)

1st GRADE - Trail Walk
1. Trees - Comparison - Shape, Size, etc.
2. Leaves - Comparison - Shape, Size, etc.

Indoors - Theme: Social Insects
1. Ants
2. Bees

2nd GRADE - Trail Walk - Animal and Plants
1. Location - Kinds
2. Needs - Food, etc.
3. Protection

Indoors
1. Moths
2. Butterflies

3rd GRADE - Trail Walk - Birds
1. Location and Identification
2. Nests

Erosion
1. Water
2. Wind

Indoors - Birds
1. Types - Where located - Feeding, etc.
2. Anatomy - Functions of: a) wings, b) beak, c) legs

4th GRADE - Trail Walk
1. Trees and plants found in the Arboretum and the uses Man derives from them
2. Conservation practices

Indoors - Insects
1. Relationship with Man
2. Anatomy - Microsopic study of Insect Parts

5th GRADE - Trail Walk
1. Life Cycle of Plants and Animals
2. Topography of Arboretum (Geology of New Jersey)

Indoors - Theme: "Web of Life"
1. Ecology of a Pond
2. Microsopic study of Life Found in a Pond

6th GRADE - Choice of Teacher
Astronomy
Outdoors - "Night Watch"
Indoors - Trip to Planetarium

Independence Outdoor Laboratory
Charlotte, North Carolina
ENVIRONMENTAL EDUCATION - OUTDOOR LABORATORY PROGRAM
CURRICULUM THEMES

*ELEMENTARY

1st GRADE: Animal Homes. Birds and mammals (including man) provide homes for their young and help to serve their daily needs.

2nd GRADE: Plant Life. Plants of any community are dependent on its neighbors (animals, soil, other plants) to meet many of its needs. Plants of a forest community help to supply many of our wants and needs. How can we in return help the forest community?

3rd GRADE: Animal & Plant Life. We must understand the needs and habits of our wildlife, the value of our trees, and apply the proper management practices if we are to continue to enjoy the benefits they provide.

4th GRADE: Water Life. Plants and animals that life in bodies of water (like the sea) are very dependent on each other and their physical environment. If these bodies of water are not polluted they can continue to help serve many of our community needs.

5th GRADE: Conservation. The relationships between resources are complex, and the management of any one resource requires careful consideration of the probable effect upon others.

6th GRADE: Interelationship of Plants & Animals. If an area of land (such as grassland) is left undisturbed in N.C., there will be a natural succession of communities from grassland to a forest. Each community will be characterized by particular plants and animals. Communities can be managed to meet our needs.

JR. HIGH

7th GRADE: Life Sciences. Basic ecology. The study of the interelationships of plants and animals with their environment contributes to a better understanding of the causes and effects of pollution.

SR. HIGH

10th GRADE: Field Ecology. Diversified studies on a group basis of plant and animal specifics with relation to their environment. Successional changes and factors affecting them.

11-12th GRADE: Environmental Education. Diversified studies on a group and individual basis of ecology, pollution, and man's impact on the biosphere.

*Additional themes are to be developed in the elementary grades, some of which will relate to other curriculum levels. (The History of Charlotte with the use of the log cabin under construction at the Independence Outdoor Laboratory.)

ADDENDA

CALIFORNIA

Science Curriculum Improvement
Study (SCIS)
Lawrence Hall of Science
University of California
Berkeley, California 94720

Mr. Jack Fishleder
Implementation Program Leader
SCIS
Lawrence Hall of Science
University of California
Berkeley, California 94720

Description: SCIS has a six-year elementary school life science program in which the children derive the basics of ecology through observing and experimenting, while they work directly with living organisms.

The six units are as follows:

First-year unit, Organisms. The children observe and experiment with a model ecosystem (a word not used, however, until the sixth year), an aquarium. The concepts of birth, death, detritus, habitat, and food web are introduced.

Second-year unit, Life Cycles. Reproduction, maturation, and successive generations are examined with individual organisms.

Third-year unit, Populations. The children observe how organisms live together and how populations change. Plant eaters, animal eaters, food chain, and food web become part of the working vocabulary.

Fourth-year unit, Environments. Survival and loss among organisms in terraria introduce the children to the ideas of limiting factors in the environment. The concepts discovered help the children redesign the conditions in their terraria.

Fifth-year unit, Communities. Food transfer through producers, consumers, and decomposers is observed as part of a community in which little is wasted.

Sixth-year unit, Ecosystems. The children construct aquarium-terrarium environments, in which larger cycles - such as the water and oxygen-carbon dioxide cycles - can develop and interdependencies of groups can be shown. The children then manipulate aspects of the system, each experiment representing a change man is making in the environment. Pollution is discussed.

Materials: Curriculum guides are available.